521 M7280 – SATELLITE GEODESY

SPRING SEMESTER 2017

Lab No. 1

handed out Wednesday, February 22, 2017
due Wednesday, March 01, 2017, 09:10 **Name:** _____

Your first Matlab program – simulating 3D points on earth's surface

1. Write a Matlab code that generates 3-D coordinates (xo,yo,zo) of 50 points (evenly distributed). These points should have the same vector length of 26371.000 km. Then add 25-m random errors to their x-y-z components. Calculate each vector length before and after adding the errors (So & Sr).

   - tabulate these 50 points with 12 columns (Pt_ID, xo, yo, zo, So, xr, yr, zr, Sr, ex, ey, ez), and list the mean and standard deviation values for ex, ey, and ez.

   - plot these 50 points in a 3-D map, together with their error vectors (you may scale up these vectors to make them more visible in the plot).

2. Describe clearly your methodology in generating those values in 1.

Your (individual) final report should contain (use A4 papers):

- this page as the cover sheet
- source code(s) and outputs; do not forget to add your name and lots of comment cards to the source listing (% .....)
- input and output files from program [input/output values used and calculated], if any
- plots, including captions on axes, title, your name, LB#/HM#, course title, date (if any)
- derivation and description of formulas used, accompanied by figures where applicable
- evidence of computational accuracy
- discussion of results